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Original

February 13, 1987

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Dear

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:

Enclosed please find the following two vertical industry analyses to be included in INPUT's Information Systems Program binder:

- Retail (Distribution) Sector
- Medical Sector

These cover each sector's driving forces, objectives, impact of technology, and budget analysis. The last section in the series, Service Industry, will be shipped by the end of February.

If you have any queries or comments, please call me at (415) 960-3990.

Sincerely,

Graham S. Kemp
Vice President

GSK:ml

Enclosures



INFORMATION SYSTEMS PLANNING REPORT
RETAIL SECTOR

DECEMBER 1986





INFORMATION SYSTEMS PLANNING REPORT
RETAIL SECTOR

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INFORMATION SYSTEMS PLANNING REPORT
RETAIL SECTOR

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I MAJOR ISSUES

A. DRIVING FORCES

- Profit margins in the retail industry are low--typically 2-3%--so pressure to improve efficiency is strong.
- Minimizing inventory and providing the best possible customer service are the keys to maximizing profits in retail.
- Retail is always the first industry sector to be affected by cyclical changes in the economy and is also the most profoundly affected sector. It is particularly important, therefore, that managers in this sector monitor changes in the economy and consumer spending and keep tight control of costs.
- The height of the economic recovery has passed, causing slackening of consumer demand.
- Computer applications in the retail and wholesale sectors are becoming more interdependent as technology advances. Inventory control applications make use of the results of sales forecasting applications to help schedule replenishments. In turn, forecasting applications utilize data collected at the point of sale.



- Competition is the fundamental driving force behind all other driving forces. Automation has become a necessity for survival as retailers use automation to continually improve service and efficiency. When asked how technology is used to give his company a competitive advantage, one survey respondent answered: "It isn't—it's just helping us maintain our current position." Technology is moving rapidly in this sector, and IS departments are racing to keep up.
- Exhibit I-1 summarizes the driving forces for the retail distribution sector.

B. ISSUES AND OBJECTIVES

- Retailers depend on communication with their distributors. Traditionally, order processing has relied on paperwork, but electronic data interchange (EDI) and electronic mail are quickly gaining favor. EDI is used in retail primarily for order entry directly to distributors' computers, thus reducing paperwork and avoiding redundant data entry.
- Compatibility and standards are major issues in retail because of the interdependence of retail systems and distribution systems and because of the importance of communications to this sector.
 - Computers for analysis and forecasting should connect with computers for inventory control, and, ideally, both should connect with point-of-sale (POS) terminals.
 - EDI is still a young technology and absolute standards have not been set. Although it is already useful, its ability to facilitate order processing and improve efficiency will increase when and if standards are developed.



EXHIBIT I-1

**RETAIL
DRIVING FORCES**

- **Low Profit Margins**
- **Economic Pressures**
- **Technology Trends**
- **Competitive Pressures**

III-RE-3



- A related issue is that of software integration. Connectable computers cannot provide maximum efficiency unless the software on one node can communicate with software on others. In order to avoid duplicating data entry, it is important that data collected for one purpose can be used for other purposes. IS managers are confronting this issue early in the implementation of automation for retail because so many applications in this sector rely on data from a single source--point of sale.
- IS managers are distributing processing power to end users at individual retail sites. This will give store managers more autonomy and will enable them to adapt to local markets.
- A number of survey respondents noted a lack of qualified software development personnel as a major hurdle in pursuing IS goals. Applications for retail are improving rapidly, and competitive considerations make it imperative for IS departments to keep up. Since most large retailers prefer to develop applications in-house rather than buying packaged software, this personnel shortage presents a challenge to IS managers.
- Exhibit I-2 summarizes the primary issues and objectives to be addressed by survey respondents.

C. IMPACT OF TECHNOLOGY

- Point-of-sale (POS) technology is the most obvious recent development in retail automation. Point-of-sale systems simplify the payment process both by simplifying the cashier's job and by offering consumers a number of ways to pay.
- Retail grocery stores are the leaders in implementation of automation. There are three ways automation improves customer service at the grocery checkout line.



EXHIBIT I-2

**RETAIL
ISSUES AND OBJECTIVES**

- **Implementation of EDI**
- **Integration and Connectivity**
- **Shortage of Qualified Applications
Development Personnel**



- Laser scanning bypasses the process of keying prices into a cash register one at a time. Scanning involves only passing items over a scanner which reads bar codes printed on labels. This automatically enters the proper prices and inventory information into the cash register.
- Electronic funds transfer (EFT) machines have begun to appear in grocery stores and gas stations. These machines allow consumers to transfer money directly from their checking accounts to stores' accounts using their bank ATM cards.
- Check approval machines reduce the time customers spend in checkout lines by automatically approving checks before shopping. The decision whether or not to approve the check is based on matching a personal identification number (PIN) with credit records stored in a central computer.
- Distributed computing power improves customer service and provides greater autonomy to store managers.
 - With computers located on the premises, each of a chain's locations can operate almost as an independent store. Payroll, staff scheduling, and time card applications can all reside on local computers.
 - Marketing personnel in individual stores have a better feel for how to address local markets than regional or corporate marketing departments. Allowing store marketing departments to analyze their own sales data enables them to develop strategies aimed at specific local markets.
- EDI drastically reduces paperwork involved with order processing. Traditional order processing methods involve as many as 17 separate forms, each of which



represents handling costs and opportunities for the introduction of human error. Order processing using EDI transfers the forms electronically.

- Advancing software technology yields more efficient programs by having a number of applications draw data from a single data base and by storing only one version of procedures that are used many times in different contexts.
- Exhibit I-3 summarizes the impact of four areas of technology on the retail sector.



EXHIBIT I-3

**RETAIL
IMPACT OF TECHNOLOGY**

TECHNOLOGY	COMMENTS
POS	Effective for Data Capture
Distributed Systems	Allows Localized Marketing Strategies
EDI	Streamlines Order Processing
Software Integration	Makes More Efficient Use of Data



II NEW APPLICATIONS

- Survey respondents listed a wide variety of applications among the programs they plan to implement in the next 12 months. A few came up repeatedly:
 - Point-of-sale (POS).
 - Price look-up.
 - EDI or other forms of data transfer.
 - Marketing and merchandising applications.
- A number of methods for capturing data at the point of sale are currently in use.
 - Kimball tags are price tags that double as small keypunch cards. Each card carries a product code that is associated with product identity, price, color, and other information held in central computers.
 - Magnetic stripes identify products by means of information magnetically encoded in price tags.
 - Optical Character Recognition (OCR) machines are capable of identifying numbers printed on price tags. Equipment for this method is currently very expensive.



- Bar code scanners are not portable. This method is likely to become the standard when portable or hand-held scanners become available.
- POS technology, including bar coding and laser scanning, makes sales data readily available to applications such as sales forecasting and inventory control.
- Price look-up enables clerks to check prices and availability of products on the spot.
- EDI will eliminate much of the paperwork associated with order processing. The EDI market is still small, but will grow at an average annual rate of over 100% for the next five years.
- Merchandising applications use sales data to help determine effectiveness of advertising and to enable decisions to be made on how to change and refine product lines.
- A few retailers indicated that they are implementing in-store marketing and customer service applications.
 - One store has installed a computerized bridal registry system in which customers look up names and items by means of a touch-screen.
 - Other in-store marketing applications allow customers to read descriptions and watch video demonstrations of products by means of touch screens or keyboards.
- In addition to EDI, price look-up, POS, and marketing applications, survey respondents listed inventory control, micro-mainframe links, sales forecasting, and price management among new applications.



- Exhibit II-1 summarizes the new applications retailers will be implementing in 1987.
- Approximately 60% of in-house programming staff will be developing new systems. The other 40% will maintain and enhance old systems.



EXHIBIT II-1

**RETAIL
NEW APPLICATIONS**

- **POS**
- **Price Look-Up**
- **EDI and Data Transfer**
- **Marketing and Merchandising**

III-RE-12



III BUDGET ANALYSIS

- IS budget growth in 1987 will be essentially flat in every category. IS managers report no change in overall IS budgets, with no category varying more than 6% from zero growth. This is consistent with IS budgets in all industries, though a bit lower than average.
- The area of greatest growth is communications at 6%. This shows, once again, the importance of communications to this sector. Retailers will be allocating more resources to EDI and networking as the technology develops and as the benefits of these forms of communication become apparent.
- Personnel expenditures will see slight growth in 1987, reflecting the shortage of qualified IS personnel (as discussed in Issues and Objectives) and the increasing sophistication of computer systems.
- "Salaries and fringes" captures the largest share of IS expenditures overall--41.8%--followed by "total hardware" with 24.3%, a surprisingly large "other" category at 15.4%, and "communications" at 12.9%. The "other" category includes forms, disks, miscellaneous supplies, and any items not included in standard budget categories.
- Approximately one-third of survey respondents indicated their budgets will increase in 1987, one-third expect a decrease, and another third expect the IS budget to be the same in 1987 as in 1986.



- Exhibit III-1 shows the 1986 budget distribution and projects growth of budget categories in 1987.



EXHIBIT III-1

1986 BUDGET DISTRIBUTION AND
1986/1987 CHANGES IN THE RETAIL DISTRIBUTION SECTOR

BUDGET CATEGORY	1986 PERCENT OF I.S. BUDGET	1986-1987 EXPECTED BUDGET GROWTH
Personnel Salaries and Fringes	41.8%	1.1%
Mainframe Processors	12.2%	(1.5)%
Minicomputers	1.2%	(2)%
Microcomputers	8.8%	(1)%
Mass Storage Devices	1.5%	(2)%
Other Hardware	.6%	(2)%
Total Hardware	24.3%	(2.5)%
Data Communications	12.9%	6%
External Software	6.1%	(1.4)%
Professional Services	1.0%	(2.5)%
Software Maintenance	3.2%	0%
Hardware Maintenance	5.8%	0%
Other	4.9%	(1)%
Total	100.0%	0%







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